A SECOND NEW SPECIES OF *GNATHOTHLIBUS* WALLENGREN (LEPIDOPTERA: SPHINGIDAE) FROM VANUATU

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Abstract

Gnathothlibus vanuatuensis sp. n. is described from Vanuatu and distinguished from *G. erotus* (Cramer) and the sympatric *G. saccoi* Lachlan & Moulds (= *G. malleti* Schmit).

Introduction

Six species and one subspecies of *Gnathothlibus* Wallengren have been described from the Asia-Pacific region. D'Abrera (1987) recorded *G. erotus erotus* (Cramer) from Sri Lanka east to the Indonesian islands of Sumatra, Java, Borneo and Sulawesi and north to the Philippines. Moulds (1986) recorded it from Christmas Island (Indian Ocean). *G. erotus eras* (Boisduval) is widespread from the Australian region to Tahiti. *G. meeki* (Rothschild & Jordan) and *G. heliodes* (Meyrick) are recorded from New Guinea and *G. brendelli* Hayes from Sulawesi (D'Abrera 1987). *G. dabrera* Eitschberger was also recorded from Sulawesi by Eitschberger (1999). *G. saccoi* Lachlan & Moulds (= *malleti* Schmit (Schmit 2003)) was recorded from Vanuatu by Lachlan and Moulds (2001) and Schmit (2002).

An undescribed species, similar to but clearly different from *G. erotus* (and previously confused with it), was collected in Vanuatu on the islands of Espiritu Santo, Malekula, Ambrym and Tanna during 1987-1989, and 2000. Schmit (2002) also recorded it (as *G. erotus eras*) from Efaté. It is described below. Placement of this new species in *Gnathothlibus* complies with the wing colouration and the generic diagnosis given by D'Abrera (1987).

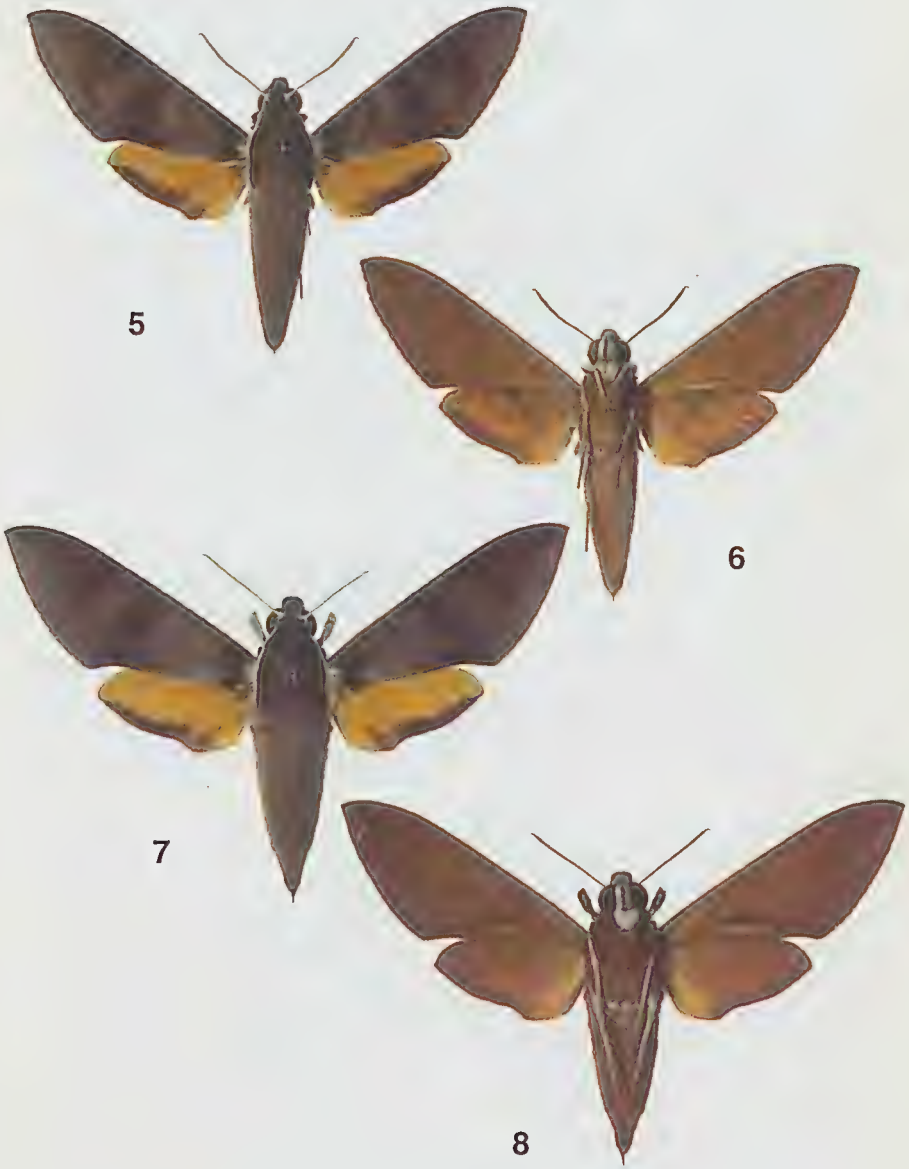
Gnathothlibus vanuatuensis sp. n.

(Figs 1-2, 5-6, 9-10, 13)

Types. Holotype ♂, VANUATU: Lowanatom, Tanna I., 8.xii.2000, R.B. Lachlan (in Australian National Insect Collection, CSIRO, Canberra [ANIC]). *Paratypes*: 2 ♂♂, 3 ♀♀, Port Olry, Espiritu Santo I., 4, 7, 22.i.1988 & 16.i.1989, R.B. Lachlan; 10 ♂♂, 7 ♀♀, Luganville, Espritu Santo I., 15, 21.xii.1987, R.B. Lachlan; 1 ♂, Vao I., 0.5 km off NE coast of Malekula I., 15.i.1989, R.B. Lachlan; 24 ♂♂, 10 ♀♀, Olal Mission area, north Ambrym I., 22.xii.1988, 7, 11.i.1989 & 19, 20, 23-28.ix.1989, R.B. Lachlan; 9 ♂♂, 2 ♀♀, Lowanatom, Tanna I., 4, 5, 8, 9.xii.2000, R.B. Lachlan (in ANIC, Australian Museum, Sydney and RBL collection).

Description. Male (Figs 1-2). Forewing length 37.5-43 mm. Antenna dark creamy-brown above, brown below; palpi dark brown above, contrasting off-white with some dark scales below; dorsal surface of head, thorax and abdomen uniform, medium brown; small dark median spot on prothorax; thin lateral creamy-brown stripe from base of antenna to posterior of thorax. Thorax ventrally with wide creamy-brown patch immediately posterior to palpi, remainder of band suffused heavily with brown to base of metathorax.

Figs 1-4. *Gnathothlibus* spp., males. (1-2) *G. vanuatuensis*, holotype: (1) upperside; (2) underside. (3-4) *G. erotus eras*: (3) upperside; (4) underside.



Figs 5-8. *Gnathothlibus* spp., females. (5-6) *G. vanuatuensis,* paratype: (5) upperside; (6) underside. (7-8) *G. erotus eras*: (7) upperside; (8) underside.

Abdominal segments laterally each with reddish-brown posterior margin contrasting with brown ground colour; abdomen with five small lateral black spots, surrounded by white. Fore tibiae covered in creamy-brown hair scales tinged with pink; fore tarsi without hair scales.

Forewing upperside as in Fig. 1; ground colour brown (slightly deeper olive-brown in fresh specimens) with darker markings; small black stigma with browny-white centre at end of discal cell; irregular lighter brown marginal band from apex to tornus, edged by a slightly curved oblique dark line from apex to vein M_1; a prominent dark, mostly straight, post median line runs from costa, where it is curved slightly distally, to inner margin; a short, irregular, slightly darker subbasal band, curved distally from costa to the dark basal patch below vein 1A+2A, edged on each side by darker, irregular lines. Forewing underside as in Fig. 2; ground colour burnt orange, lighter and without markings basad; speckled with dark brown distally; stigma usually very faint; a dark, straight subterminal line angled inwardly from apex to vein M_2 then irregular to tornus; two dark parallel post median lines from costa to vein CuA_2, the distal line more prominent, these median and post median lines can be fainter and reach only vein R_5 in some specimens.

Hindwing upperside as in Fig. 1; ground colour orange; a slightly variable, dark brown terminal band from apex to tornus at least 2 mm wide at vein M_3, thinnest at apex; inner margin of band irregular and suffused with orange scales. Hindwing underside as in Fig. 2; ground colour light orange-brown; heavily speckled with dark brown; marginal area darker from apex to tornus; dark, mostly straight submedian band, thickest at costa, curving proximad from costa to vein 1A+2A and touching distal edge of cell; a less prominent parallel dark post median band of spots to veins Rs or M_1, in many specimens this line also reaches vein 1A+2A.

Male genitalia (Figs 9-10). Uncus in lateral view longish slender, parallel sided, gently arched, distally enlarged with small dark ventral tooth and small dorsal crest, distal margin slightly convex; gnathos in lateral view thin, straight, gradually tapering to a small upturned point; in dorsal view gnathos is wide, with a slight incurve at attachment point to tegumen, distally tapering to a point with curved sides; valva gently convex at ventral margin, dorsal margin tending straight then slightly convex, distally rounded; sacculus process robust, distal end dark, spine-like, upturned; aedeagus in lateral view with end tapered to a rounded apex with dorsal backward directed barb, with a smaller ventral barb a little proximad of dorsal barb.

Female (Figs 5-6). Forewing length 39.5-48.8 mm. Head and tegulae dark brown. Median area of thorax and abdomen above uniform medium brown. Abdomen below reddish-brown with contrasting darker brown markings. Fore tibiae as in male, covered in long cream hair scales, suffused with pink on anterior edge and darker at distal end of posterior edge; fore tarsi as in male, without hair scales.

Forewing upperside as in Fig. 5; ground colour and pattern in shades of brown, darker and more prominent than male; small black stigma with light centre at end of discal cell. Forewing underside similar to male but ground colour medium orange-brown, tending pinker along distal edges; stigma not visible; distinctly speckled with dark brown distally, with two dark parallel post median lines from costa to at least vein M_1, often reaching vein CuA_2.

Hindwing upperside similar to male but dark brown terminal band broader, with inner margin fairly straight in most specimens and suffused with orange scales; this band normally terminates at tornus at vein 1A+2A, its inner margin not running basad along this vein further than the brown band along vein CuA_2. Hindwing underside ground colour same as forewing but more heavily speckled with dark brown; yellowish streak along vein 1A+2A.

Female genitalia. Apophyses posteriores long, very slender, minutely enlarged subapically; apophyses anteriores spatulate on distal half, signum very long and narrow, extending full length of corpus bursae and consisting of a pair of closely parallel lines of cornuti.

Figs 9-12. Male genitalia of *Gnathothlibus* spp. (9-10) *G. vanuatuensis* paratype, Tanna I.: (9) genitalia *in situ* but with left valva removed, lateral view; (10) gnathos, dorsal view; (11-12) *G. erotus eras,* Julatten, north Queensland: (11) genitalia *in situ* but with left valva removed, lateral view; (12) gnathos, dorsal view.

Etymology. The specific name *vanuatuensis* is derived from the island nation of Vanuatu, the only known locality for the species.

Distribution. At present *G. vanuatuensis* is known from the islands of Espiritu Santo, Vao (just off Malekula), Ambrym, Efaté and Tanna. Specimens were first collected in December 1987 and January 1988 on Espiritu Santo and subsequently in January and September 1989 on Ambrym and January 1989 on Vao. In December 2000, many specimens were taken on Tanna in southern Vanuatu. Schmit (2002) recorded it from Efaté in April and May.

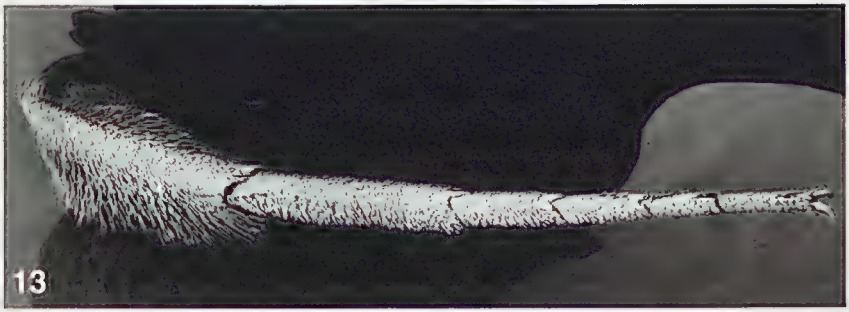
Discussion

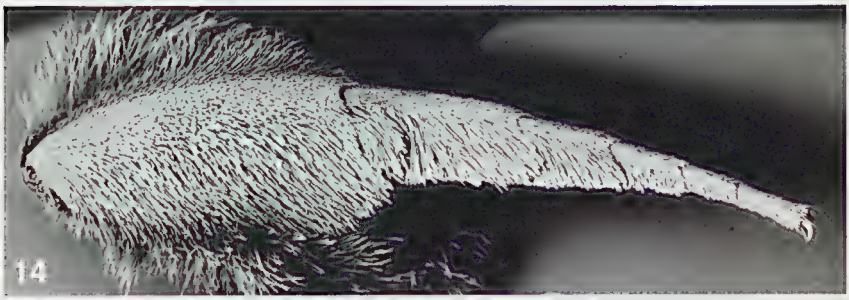
Gnathothlibus vanuatuensis most closely resembles *G. erotus eras*, the common subspecies occurring in Australia, Papua New Guinea, Solomon Islands (Tennent 1999) and New Caledonia to Tahiti. *G. vanuatuensis* is readily distinguished from both *G. saccoi* (see Lachlan and Moulds 2001) and *G. erotus eras* (Figs 3-4, 7-8, 11-12, 14) by the complete absence of any long hair scales on the fore tarsi and a clear reduction in length and thickness of the long hair scales covering the fore tibiae in males (Fig. 13).

Both sexes of *G. vanuatuensis* have consistent, more prominent forewing markings than *G. erotus* and in this respect are similar to *G. saccoi*. Clark (1922) described subspecies *G. erotus cramptoni* Clark from Guam based primarily on this character but Kitching and Cadiou (2000) synonymised it because other Pacific Island populations are known to exhibit strong forewing markings.

The forewing stigma on both sexes of *G. vanuatuensis* is more evident than generally seen on *G. erotus*, where it is usually reduced or absent. The males of *G. vanuatensis* are slightly smaller than those of *G. erotus* but females are clearly smaller. The dark brown terminal band on the hindwing of males of *G. vanuatuensis* is wider than in *G. erotus eras*; in females the inner margin of this band does not run basad along vein 1A+2A, as often occurs in *G. erotus eras* females; the median line on forewing upperside, distal of stigma, is straighter and less curved near costa than in *G. erotus*; the oblique band bordered distally by this median line and encasing the stigma is clearly narrower where it reaches the inner margin than in *G. erotus*.

Some specimens of *G. vanuatuensis* exhibit a general greenish tinge on the forewing upperside, as in *G. saccoi,* but this tinge is not seen in *G. erotus*. On the forewing underside of *G. vanuatuensis*, two dark-spotted, median, oblique lines are usually visible from costa to vein M_1, sometimes extending to the termen in heavily marked specimens; these lines are generally vestigial or missing in *G. erotus eras*. On the hindwing underside there is one, often two, oblique, brown, speckled, parallel lines from costa to vein CuA_2, the median line touching the apex of the discal cell; in *G. erotus* these two lines are usually vestigial or missing and clearly distad compared with those of *G. vanuatuensis*.





Figs 13-14. Micrographs of *Gnathothlibus* spp., fore tarsi and tibiae of males showing leg scales. (13) *G. vanuatuensis*; (14) *G. erotus eras.*

The thorax of *G. vanuatuensis* has in males, ventrally, creamy-brown pilosity suffused with brown scales; this is whiter and more extensive towards the abdomen in *G. erotus*.

The male genitalia of *G. vanuatuensis* (Figs 9-10) differ from those of *G. erotus* (Figs 11-12) in lateral view in having a shorter uncus. The posterior margin of the tegumen of *G. vanuatuensis* is straighter and slightly indented as in *G. saccoi* (clearly curved in *G. erotus*). The upper margin of each valva of *G. vanuatuensis* is nearly straight basally with a slight upward curve distally (this curve is much more distinct in *G. erotus*). In dorsal view (Fig. 10) the gnathos of *G. vanuatuensis* is slightly wider with curved edges tapering to a point distally; the incurve at attachment is greater in *G. erotus* and the sides are straighter as they taper to a point (Fig. 12). In *G. saccoi* the apex of the uncus in lateral view is dorsally rounded rather than crested and the sacculus of each valva is much broader (Lachlan and Moulds 2001).

G. saccoi is the only other species of *Gnathothlibus* recorded from Vanuatu. Previous records of *G. erotus eras* from Esperitu Santo, Ambrym and Efaté (Lachlan and Moulds 2001, Schmit 2002) are based on misidentifications of *G. vanuatuensis*.

Acknowledgements

We sincerely thank the late Father Albert Sacco for inviting RBL to stay at his missions at Port Olry on Espiritu Santo, Olal on Ambrym and Lowanatom on Tanna during collecting trips, as well as his companionship over all these years. He passed away on 29 January 2002, aged 81 years. For comments on the manuscript we sincerely thank Dr Ian Common (Honorary Research Fellow, CSIRO, Canberra). For the photographs and scanning electron micrographs we thank Stewart Humphreys and Sue Lindsay respectively (both Australian Museum). We also thank Deborah Lachlan for typing the manuscript.

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